

MODEL 208

SERVICE DATA SHEET No. I

CIRCUIT DESCRIPTION

Designed to work on A.C. or D.C. mains from 195—255 volts, the M.208 is a four valve plus rectifier, 2 wave-band superheterodyne receiver, employing UCH42, UF41, UBC41, UL41 and UY41, with a high efficiency loop aerial wound on a ferrite rod. The wavebands are M.W.180—550 metres, and L.W.1000—2000 metres. No external aerial or earth connections are provided.

AERIAL

The tuned ferrite rod aerial input, L_1 , $C_2 + C_3$ on M.W. and $L_1 + L_2$, C_1 , $C_2 + C_3$ on L.W., is fed to the hexode control grid of the triode hexode frequency changer (UCH42).

OSCILLATOR

The oscillator anode coils L_4 (LW) and L_6 (MW) are untuned, and coupled to L_3 (LW) and L_5 (MW) which are tuned by C_4 . On the M.W. adjustment is by C_5 (across the gang) and C_{10} (across the padder C_9). On L.W. adjustment is by C_6 across the fixed minimum capacitor C_7 .

I.F. STAGE

The intermediate frequency signal (470 Kc/s) is fed via the permeability tuned I.F. transformer L_7 , L_8 and C_{11} , C_{12} to V2 the variable-mu I.F. pentode UF41, and thence through the second permeability tuned I.F. transformer L_9 , L_{10} and C_{14} , C_{15} to the signal diode circuit of the double diode triode UBC41, the I.F. filter consisting of C_{16} , R_4 and C_{17} .

SECOND DETECTOR, A.F. AND OUTPUT STAGE

The automatic gain control diode is coupled from the signal diode via C_{21} . The automatic gain control voltage is developed across R_7 decoupled by R_3 and C_{19} , and is applied to the hexode control grid of the frequency changer, and to the control grid of the I.F. valve. The A.F. voltage developed across the potentiometer R_5 , which is part of the diode load, is fed to the triode grid via C_{18} . The triode grid leak is R_6 . Cathode bias is developed across R_8 , by-passed by C_{20} , and is common to the I.F. and double diode triode valves, also supplying a delay voltage for the automatic gain control. The amplified A.F. signal developed across R_9 is fed via C_{22} and R_{10} to the control grid of the output valve UL41. Automatic bias is supplied by R_{11} . The low impedance loudspeaker is matched to the output valve by T_1 . Tone correction is by C_{23} .

POWER SUPPLY AND SMOOTHING

The H.T. voltage is supplied by a half wave rectifier UY41 with reservoir capacitor C_{26} . Smoothing for the output valve anode is by R_{13} , C_{25} . R_{13} is chosen to avoid excessive voltage drop whilst maintaining adequate smoothing. Further smoothing for the main H.T. line is by R_{12} , C_{24} . The heaters of the valves are fed in series through the tapped mains dropper, a surge limiter of 100 ohms for the rectifier anode is included in the dropper, the whole resistor being R_{14} .

The dial bulbs are shunted by resistor R_{15} , so that should the dial bulbs fail, the set will still function. C_{27} is included to reduce the effect of noise pick-up by the mains supply, which would otherwise find its way into the aerial circuitry by radiation of the wiring.

VOLTAGE MEASUREMENTS

All voltages relative to chassis and D.C. unless otherwise stated. Measurements made with M.7 AVO on 400 v. range unless otherwise stated.

100 v. range indicated thus +

10 v. range as indicated thus =

1 v. range as indicated thus ×

VALVE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
UCH 42	H 25·2 A.C.	AH 144	AT 56+	G3.GT —	G.2.G.4. 67·5	G1 —	K —	H 12·9 A.C.
UF 41	H 38 A.C.	A 144	KS.G3 ·55×	— —	G2 67·5+	G1 —	KS.G3 ·55×	25·2 A.C.
UBC 41	H —	AT 50·6	GT —	— —	AD —	AD —	K ·55×	H 12·9 A.C.
UL 41	79·8 A.C.	A 172	— —	— —	G2 150	G1 —	K 7·85=	38 A.C.
UY 41	107 A.C.	AD 220 A.C.	— —	— —	— —	— —	K 220	79·8 A.C.

Above Voltages for Input of 238 v. A.C. on 236/255 Tap.

Input 250 v. A.C. on 236/255 v. tap for Ripple Current Measurement.

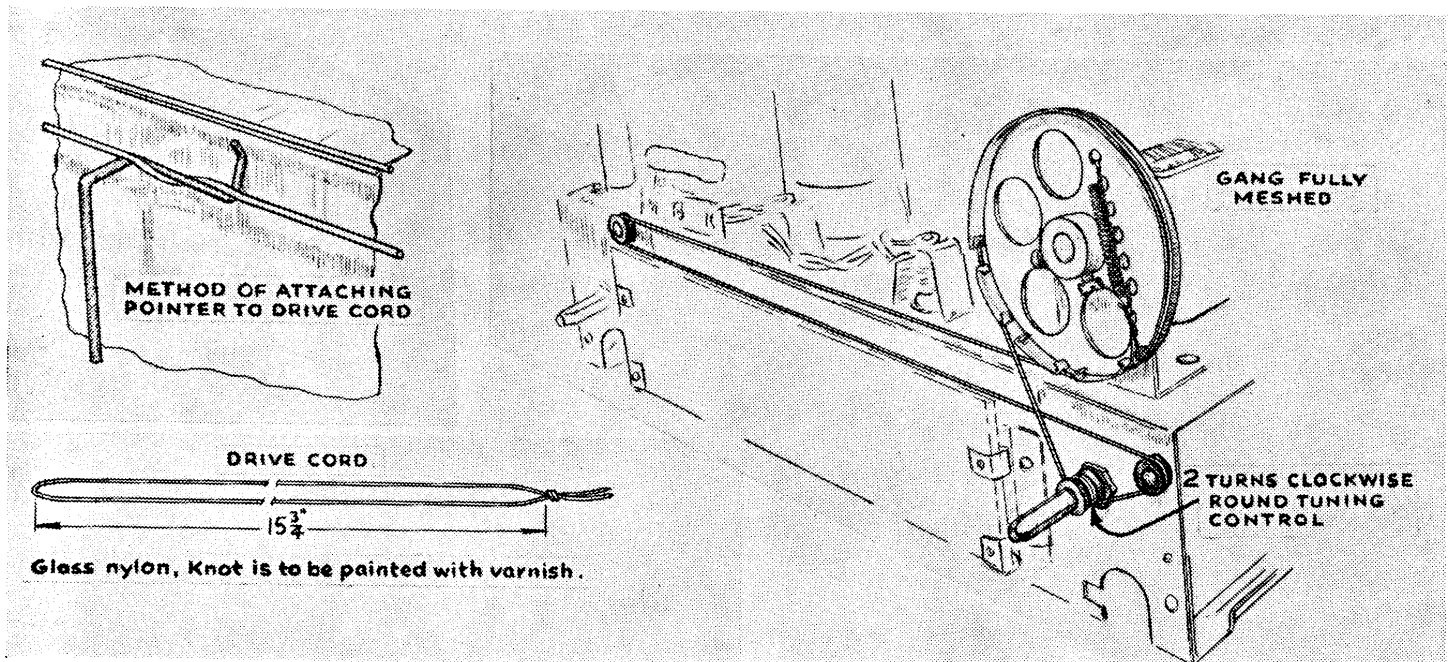
Electrolytic ripple current—99 ma in reservoir (measured on M.I. milliammeter).

Peak Voltage : 253 volts.

Ripple Voltage : 48 volts.

Dial bulbs : 6·3 v. ·115 amp. G.E.C.

DRIVE CORD AND POINTER FITTING



RESISTANCE VALUES

L. No.	DESCRIPTION	Ohms.
L1	L.W. Aerial Loop	3·4
L2	M.W. Aerial Loop	·8
L3	L.W. Osc. Grid Coil	13
L4	L.W. Osc. Coupling Coil	1·7
L5	M.W. Osc. Grid Coil	6·3
L6	M.W. Osc. Coupling Coil	1·2
L7	1st I.F. Transformer Primary	5·35
L8	1st I.F. Transformer Secondary	5·35
L9	2nd I.F. Transformer Primary	5·35
L10	2nd I.F. Transformer Secondary	5·35
T1	L.S. Output Transformer Primary	350
	Sec.	·47
	Loud Speaker Speech Coil	3

FERRITE ROD REMOVAL

The ferrite aerial rod is very brittle and it is recommended that it should be removed before turning the chassis on its back for repairs etc.

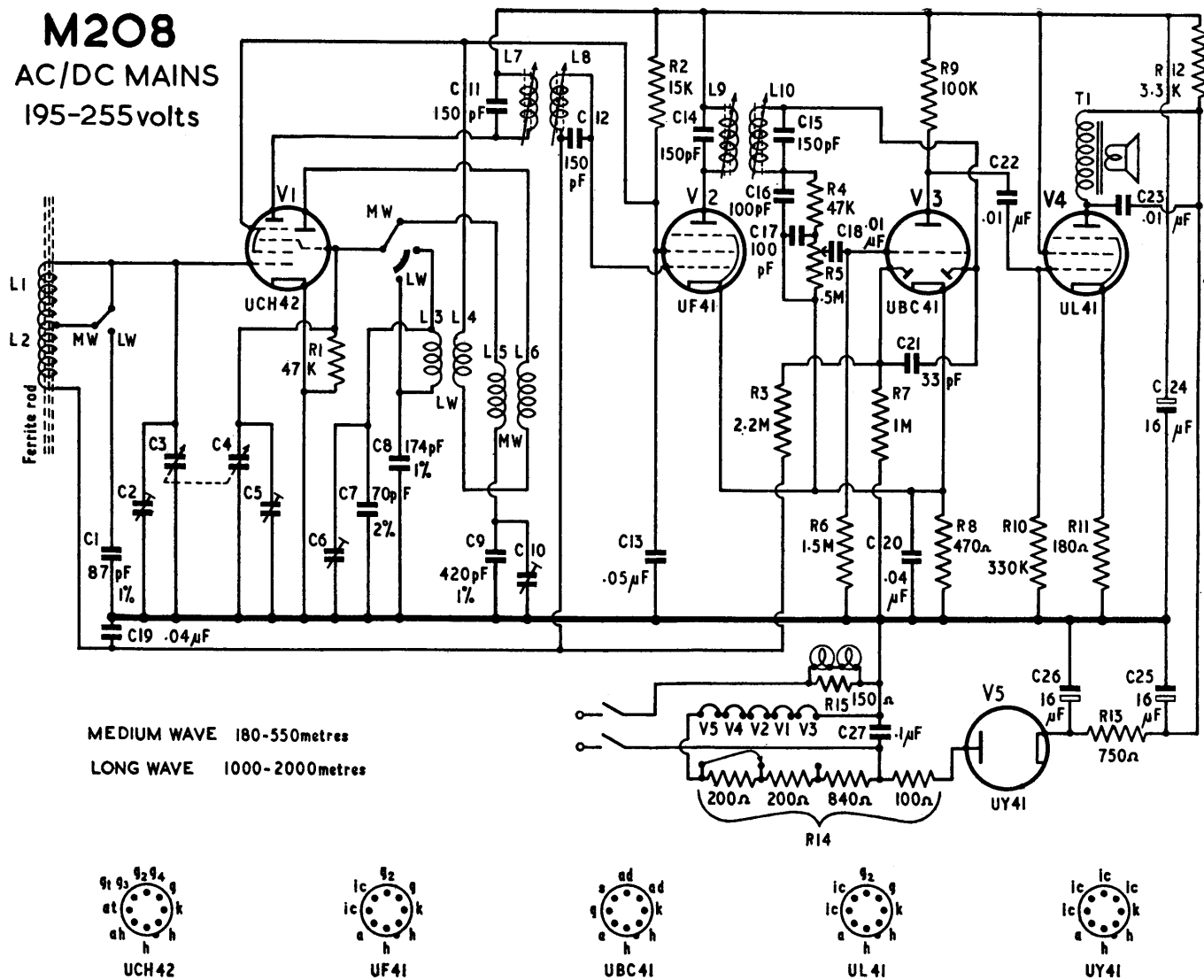
The rod is supported on paxolin panels which are clipped to the metal brackets on the chassis by means of two spring clips. These clips are removed by gently squeezing the tongue. The clip will then push through the hole.

It is not necessary to unsolder the leads to the connecting tags, provided care is taken not to stand the chassis on the rod.

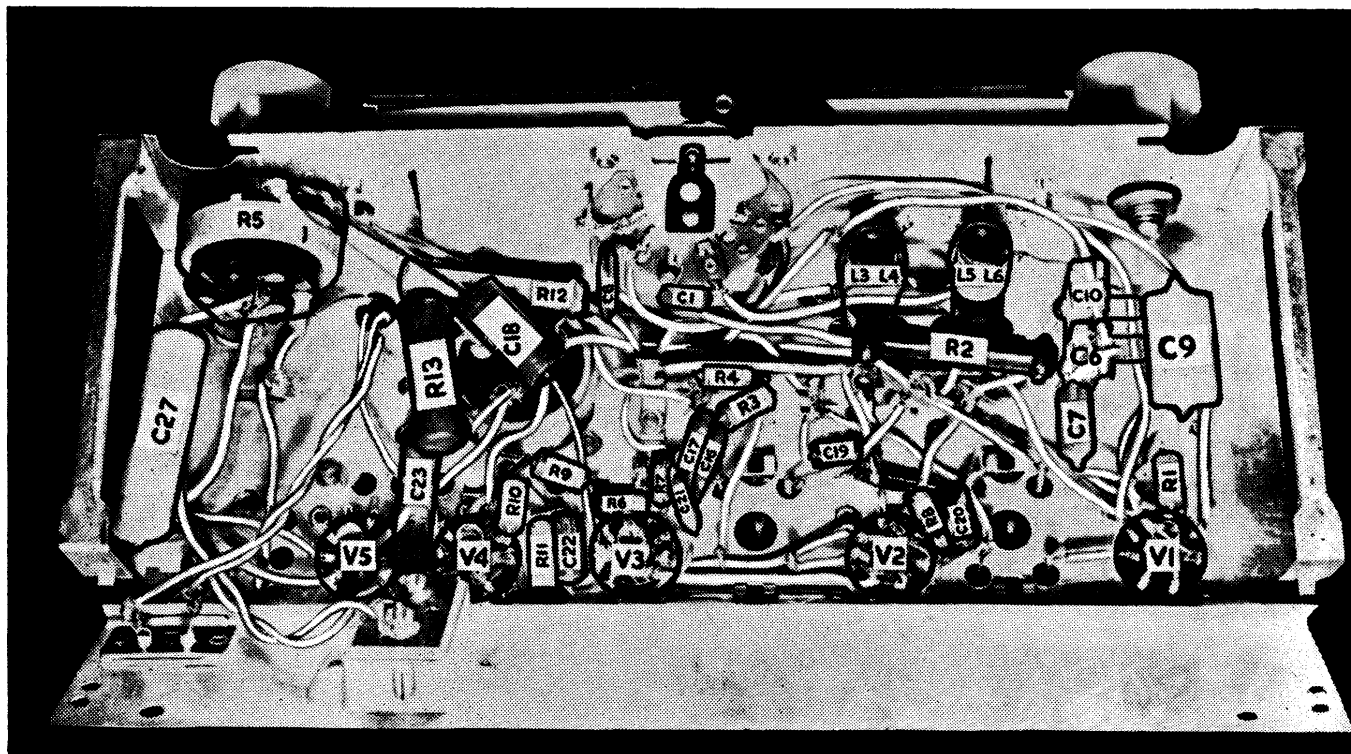
The clips can be replaced by pressing them firmly into the hole. Make sure that the face of the spring clip is pressed well against the paxolin.

CIRCUIT DIAGRAM

M208
AC/DC MAINS
195-255volts



UNDER CHASSIS



CIRCUIT ALIGNMENT

Equipment required :—
Calibrated signal generator.
Insulated trimming screwdriver.
6 BA Box spanner.
Coupling Loop, see diagram.
A.C. voltmeter across speech coil Terminals.

I.F. ALIGNMENT.

Unscrew both cores on each transformer until they are flush with the ends of the cans.

With the wave change switch to M.W. and the gang fully meshed, apply a 470 Kc/s signal to frequency changer control grid, alternatively the signal may be injected by the single turn loop as used for calibration. Then, using the insulated trimming tool, adjust the cores for maximum output. The following sequence to be used :—

- No. 1. Top core 2nd I.F. Transformer.
- No. 2. Bottom core 2nd I.F. Transformer.
- No. 3. Top core 1st I.F. Transformer.
- No. 4. Bottom core 1st I.F. Transformer.

Maintain gain control at maximum, reducing the generator output as circuits come into line to prevent A.V.C. circuit operating.

Repeat No. 1 to No. 4 at least once.

SIGNAL CALIBRATION

Set the pointer to the extreme right-hand dot on the M.W. scale with the gang fully meshed.

MEDIUM WAVE

With wave change switch in M.W. position, set pointer to 200 metres and inject 1500 Kc/s. Set coupling loop to not less than the rod length (i.e. 8") on the right of the receiver. Tune the 1500 Kc/s signal with C5, then adjust C2 for maximum response.

Inject a signal of 600 Kc/s, adjust the M.W. padder C10 for maximum response whilst rocking the gang. Check that this point coincides with 500 m. on the scale.

Repeat both operations until no improvement can be obtained.

LONG WAVE

With the wave change switch to L.W., inject a signal of 300 Kc/s, set pointer to 1000 metres and tune L.W. oscillator trimmer C6 for maximum response whilst rocking the gang. Check that this point coincides with 1000 metres on the scale.

ELECTROSTATICALLY SCREENED COUPLING LOOP

